MULTIPLE COMPACT DISC PLAYER

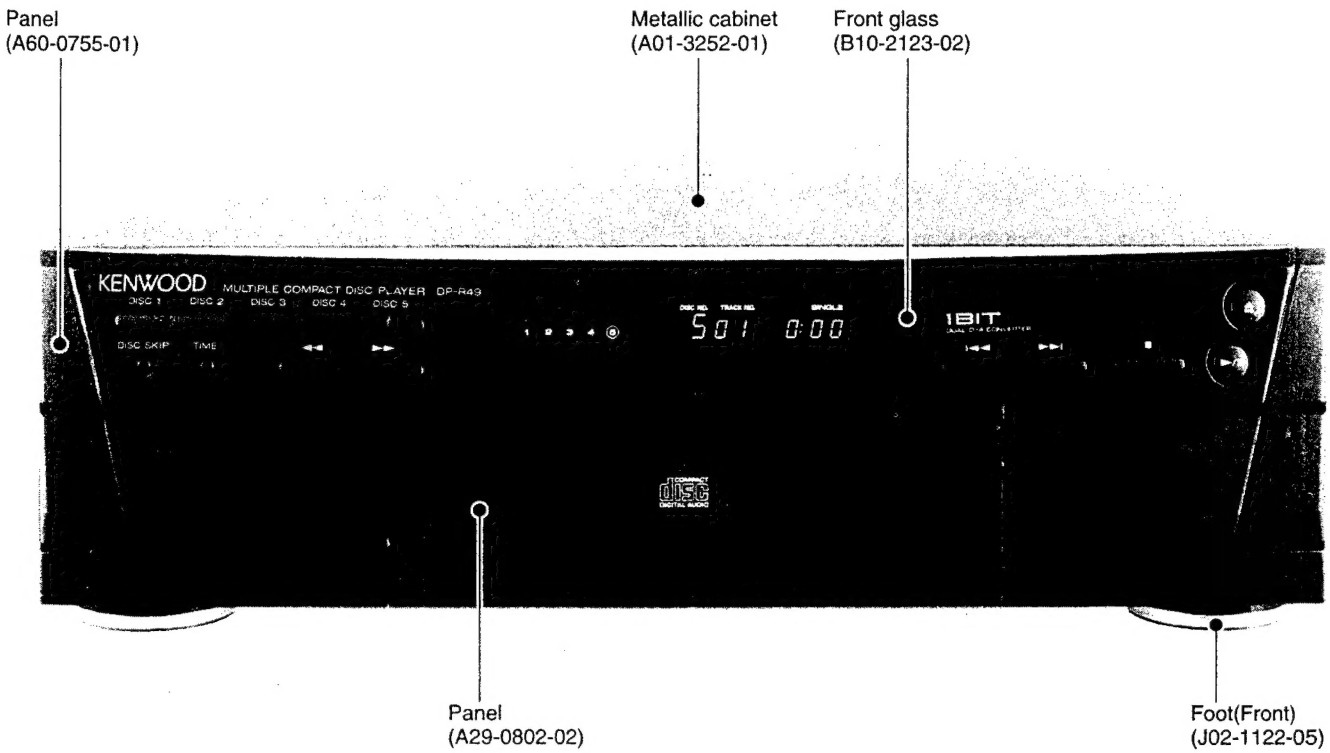
DP-R49

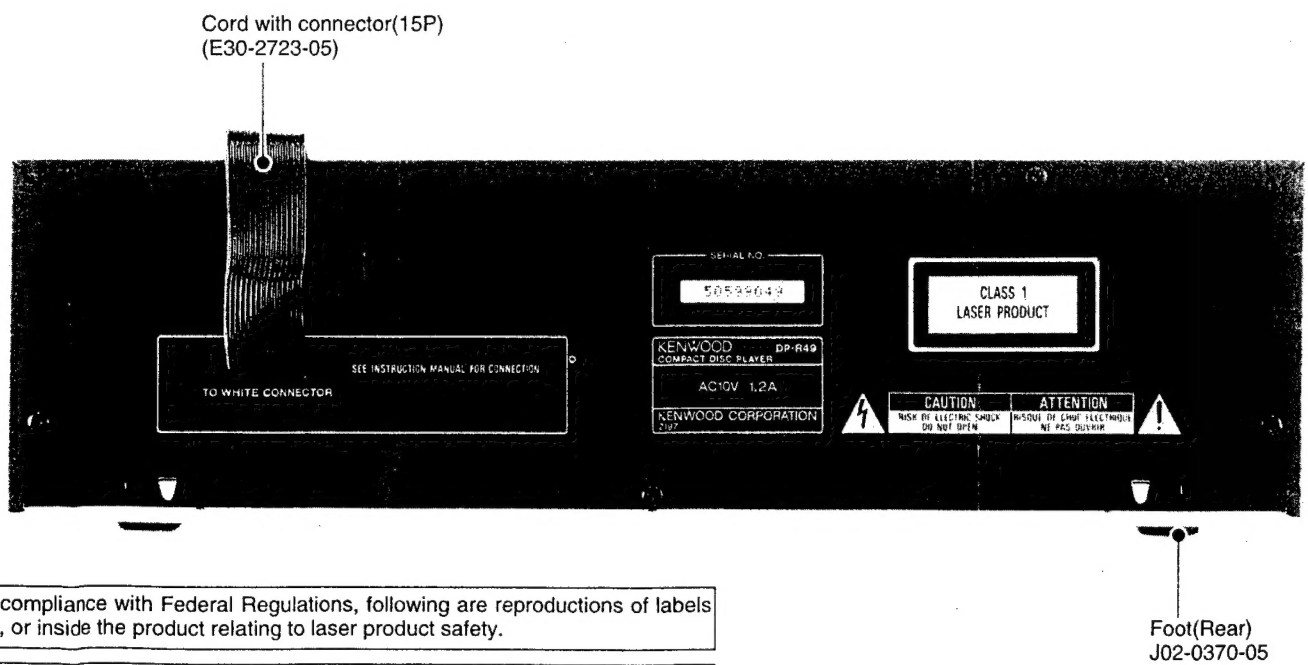
SERVICE MANUAL

(MIDI M-29M/M-49M/M-686M)

KENWOOD

B51-5087-00 (K) 2770





In compliance with Federal Regulations, following are reproductions of labels on, or inside the product relating to laser product safety.

KENWOOD-Corp. certifies this equipment conforms to DHHS Regulations No. 21 CFR 1040. 10, Chapter 1, Subchapter J.

DANGER : Laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.

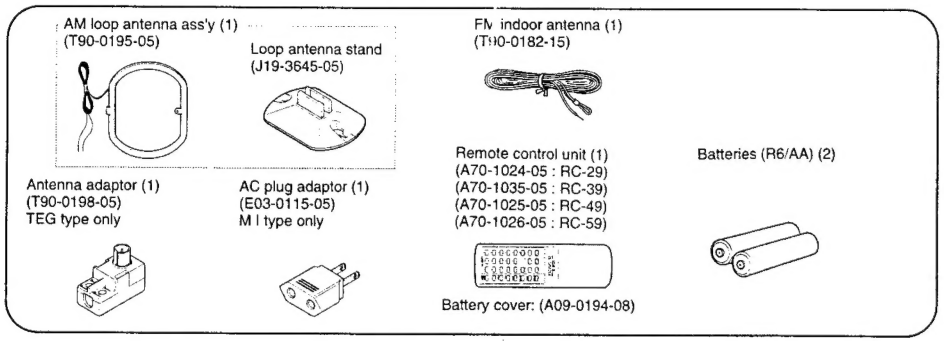
PRECAUTIONS FOR REPAIR

DP-R49 does not have a power supply transformer.Use RX-49, RX-59 or PS-94UA power supply to supply power.

CONTENTS / ACCESSORIES

For BTL Driver BA6198FP(X32-,IC3), refer to the Service Manual of DP-J695/J1070/J2070.

Accessories (All accessories are packed with the Receiver unit.)



System configuration

System	Receiver	CD Player	Speaker
M-49M	RX-49	DP-R49	LS-29/49/59
M-49	RX-49	DP-29	LS-29/49
M-29M	RX-49	DP-R49	LS-29/29M
M-29	RX-29	DP-29	LS-29/29M

Instruction manual (M-49 / M-49M / M-29 / M-29M)

ENGLISH	B60-2238-00	YMIXT
FRENCH	B60-2239-00	E
GERMAN	B60-2240-00	EG
DUTCH	B60-2241-00	E
ITALIAN	B60-2242-00	E
SPANISH	B60-2243-00	ME
CHINESE	B60-2244-00	MI
TAIWANESE	B60-2245-00	M
PORTUGUESE	B60-2343-00	ME

System	Receiver	CD Player	Speaker
M-686M	RX-59	DP-R49	LS-59
M-686LD	RX-59	LVD-59	LS-59
M-383LD	RX-39	LVD-59	LS-39

Instruction manual (M-686M / M-686LD)

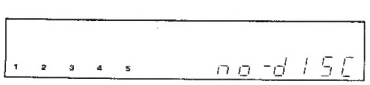
ENGLISH	B60-2246-00	MI
CHINESE	B60-2248-00	MI
TAIWANESE	B60-2249-00	M

Instruction manual (M-383LD)

ENGLISH	B60-2329-00	MI
CHINESE	B60-2331-00	MI
TAIWANESE	B60-2332-00	M

Caution

Note related to transportation and movement
Before transporting or moving this unit, carry out the following operations.
1. Turn the power ON but do not load a disc.
2. Wait a few seconds and verify that the display shown appears.
3. Turn the power OFF.

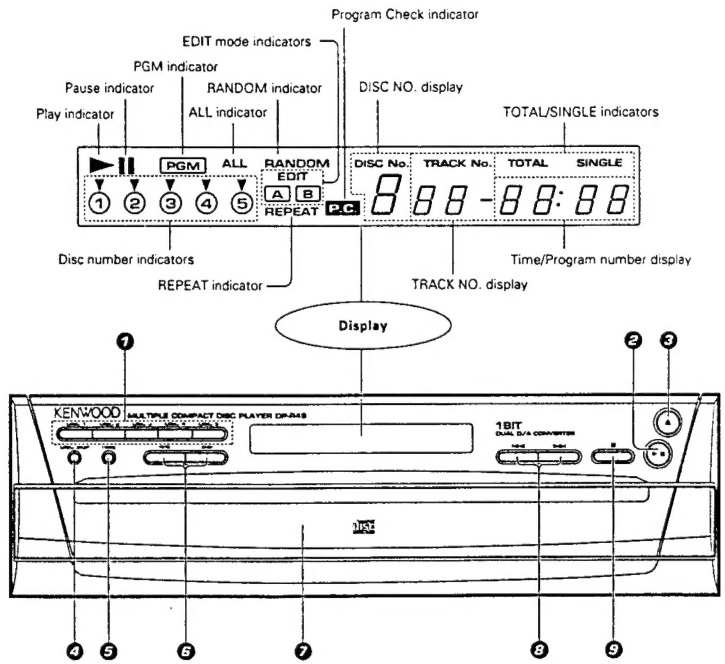


Beware of condensation
When water vapor comes into contact with the surface of cold material, water drops are produced. If condensation occurs, correct operation may not be possible, or the unit may not function correctly. This is not a malfunction, however, and the unit should be dried. (To do this, turn the POWER switch ON and leave the unit for several hours.)

Be especially careful in the following conditions:
- When the unit is brought from a cold place to a warm place, and there is a large temperature difference.
- When a heater starts operating.
- When the unit is brought from an air-conditioned place to a place of high temperature with high humidity.
- When there is a large difference between the internal temperature of the unit and the ambient temperature, or in conditions where condensation occurs easily.

DP-R49

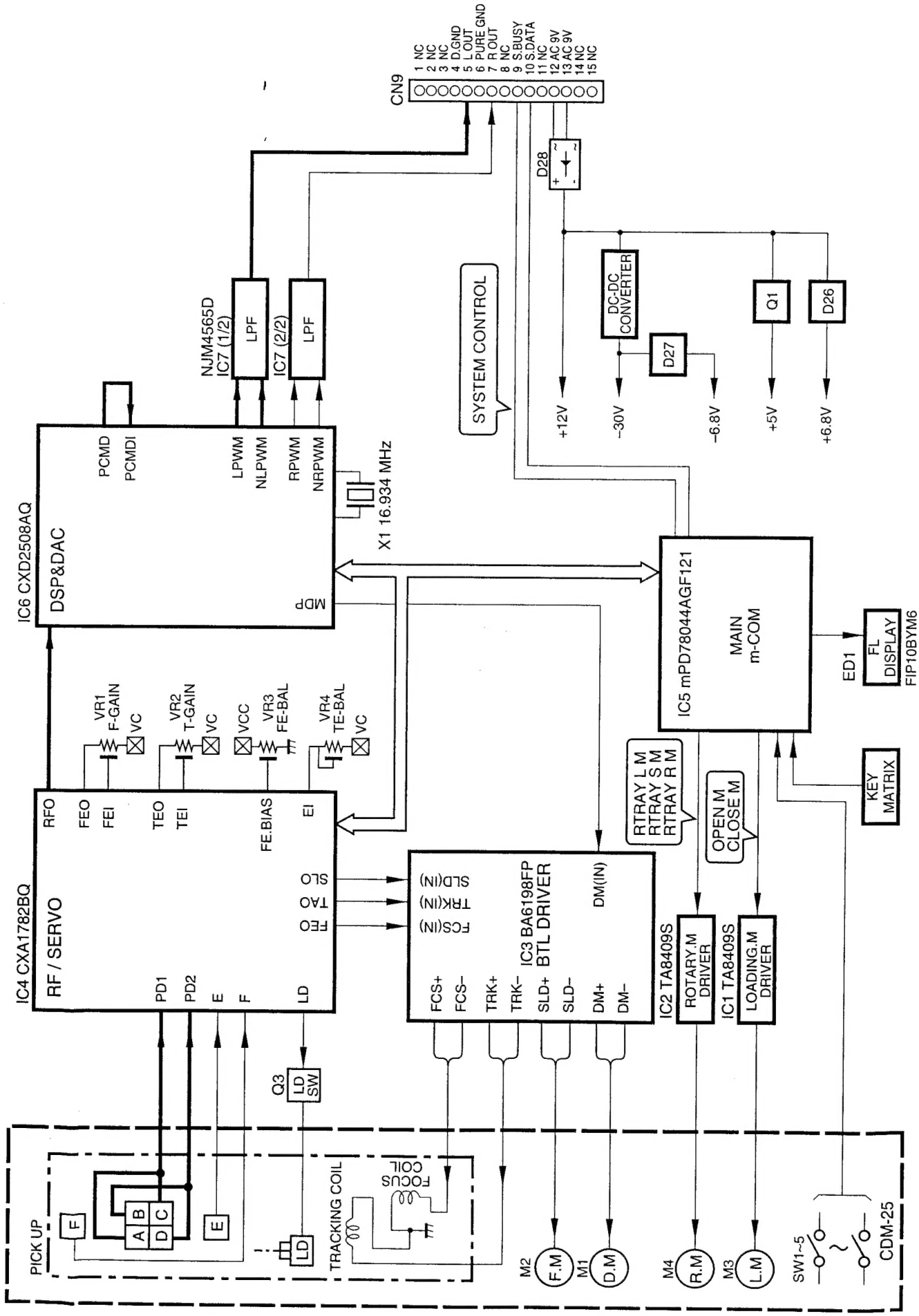
CONTROLS



❶ **Disc selector keys (DISC 1~DISC 5)**
❷ **Play/pause key**
❸ **Open/Close key**
❹ **DISC SKIP key**
❺ **TIME key**
❻ **Search keys**
❼ **Disc tray**
❽ **Skip keys**
Press to skip to the beginning of another track.
❾ **Stop key**

DP-R49

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

1. Test mode

Test mode begins from the state a disc clamped. Please clamp a disc as follows.

1. Turn the power ON (normal mode) and set the test disc on the tray.
2. Press the PLAY key. During play mode, press the OPEN/CLOSE key.
3. Turn the power OFF.

- As the tray removed, the clamper can be moved by hand.

1-1 Setting the test mode

- The microprocessor built in the unit can be put to TEST MODE by just pressing the TIME key when set to power on.

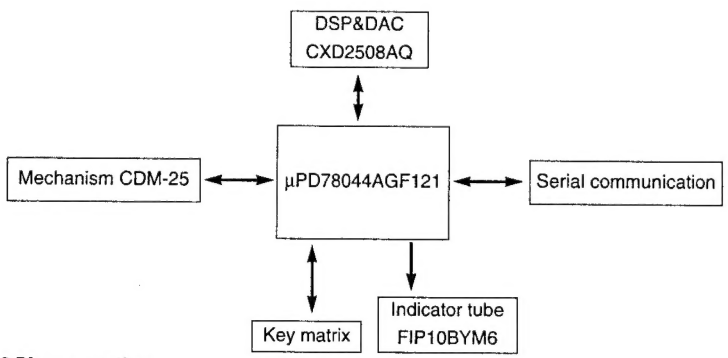
1-2 Key vs Function in test mode

Step	Key name	Description	Display
1	PLAY	03 mode↔05 mode	03↔05
2	UP	Display goes on	
3	DOWN	Display goes off	
4	DISC 1	Search the position of Disc No.1	
5	STOP	Stop	00
6	DISC 2	Release the Test mode	

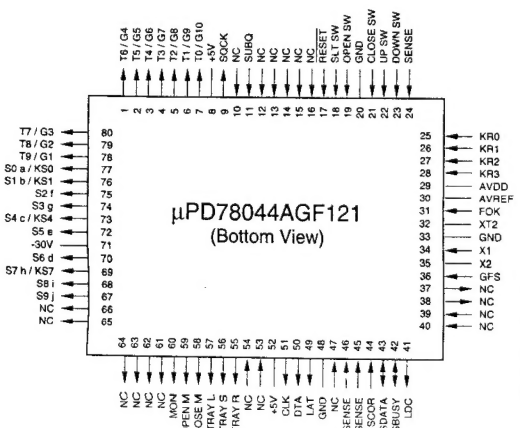
	03 mode	05 mode
Focus servo	ON	ON
Tracking servo	OFF	ON
Feed servo	OFF	ON

2. Microprocessor : μPD78044AGF121(X32-,IC5)

2-1 Block diagram



2-2 Pin connection



Key matrix

	SCAN0	SCAN1	SCAN4	SCAN7
KR0	FB	DISC 5	STOP	PLAY/PAUSE
KR1	DISPLAY	DISC 4	UP	OPEN/CLOSE
KR2	DISC SKIP	DISC 3	DOWN	-
KR3	DISC 1	DISC 2	FF	-

CIRCUIT DESCRIPTION

2-3 Pin description

No.	Name	I/O	Description	No.	Name	I/O	Description
1	T6/G4	O	FL grid 4	41	LDC	O	Laser signal output
2	T5/G5	O	FL grid 5	42	SBUSY	I/O	System serial BUSY signal input/output
3	T4/G6	O	FL grid 6	43	SDATA	I/O	System serial DATA signal input/output
4	T3/G7	O	FL grid 7	44	SCOR	I	Sub-cord synchro detection signal
5	T2/G8	O	FL grid 8	45	PSENSE	I	Position detection (CDM-25)
6	T1/G9	O	FL grid 9	46	DSENSE	I	Disc detection (CDM-25)
7	T0/G10	O	FL grid 10	47	N.C	I	Not used (+5V)
8	V_{DD}	-	Power supply (+5V)	48	GND	-	Not used (GND)
9	SQCK	O	Q-data read clock output	49	LAT	O	Latch output to CXD2500
10	N.C	I	Not used(Pull down GND)	50	DTA	O	Data output to CXD2500
11	SUBQ	I	Q-data input	51	CLK	O	Clock output to CXD2500
12	N.C	I	Not used (Pull down GND)	52	V_{DD}	-	Power supply (+5V)
13	N.C	I	Not used (Pull down GND)	53	N.C	I	Not used (Pull down GND)
14	N.C	I	Not used (Pull down GND)	54	N.C	I	Not used (Pull down GND)
15	N.C	I	Not used (Pull down GND)	55	RTRAY R	O	Rotary tray motor control (CW)
16	N.C	I	Not used (Pull down GND)	56	RTRAY S	O	Rotary tray motor control (Speed down)
17	RESET	I	µ-com reset	57	RTRAY L	O	Rotary tray motor control (CCW)
18	SLT SW	I	Start limit switch input (CDM-25)	58	CLOSE M	O	Close motor control
19	OPEN SW	I	Open switch input (CDM-25)	59	OPEN M	O	Open motor control
20	AV_{SS}	-	Not used (GND)	60	MON	O	Focus lock countermeasure
21	CLOSE SW	I	Close switch input (CDM-25)	61	N.C	O	Not used (OPEN)
22	UP SW	I	Up switch input (CDM-25)	62	N.C	O	Not used (OPEN)
23	DOWN SW	I	Down switch input (CDM-25)	63	N.C	O	Not used (OPEN)
24	SENSE	I	SENSE input from CXD2517	64	N.C	O	Not used (OPEN)
25	KR0	I	Key return 0	65	N.C	O	Not used (OPEN)
26	KR1	I	Key return 1	66	N.C	O	Not used (OPEN)
27	KR2	I	Key return 2	67	S9 j	O	FL segment j
28	KR3	I	Key return 3	68	S8 i	O	FL segment i
29	AV_{DD}	-	Not used (+5V)	69	S7 h/KS7	O	FL segment h/Key scan 7
30	AVREF	-	Not used (GND)	70	S6 d	O	FL segment d
31	FOK	I	FOK signal input	71	VLOAD	-	-30V power supply for FL driver
32	XT2	-	Not used (OPEN)	72	S5 e	O	FL segment e
33	V_{SS}	-	GND	73	S4 c/KS4	O	FL segment c
34	X1	I	System clock input	74	S3 g	O	FL segment g
35	X2	-	Not used (OPEN)	75	S2 f	O	FL segment f
36	GFS	I	Frame signal input	76	S1 b/KS1	O	FL segment b/Key scan 1
37	N.C	O	Not used (OPEN)	77	S0 a/KS0	O	FL segment a/Key scan 0
38	N.C	O	Not used (OPEN)	78	T9/G1	O	FL grid 1
39	N.C	I	Not used (Pull down GND)	79	T8/G2	O	FL grid 2
40	N.C	I	Not used (Pull down GND)	80	T7/G3	O	FL grid 3

DP-R49

CIRCUIT DESCRIPTION

3. DSP&DAC : CXD2508AQ (X32- A/2, IC6)

3-1 Pin description

No.	Name	I/O	Description
1	SCOR	O	Outputs high signal when either sub code sync S0 or S1 is detected
2	SBSO	O	Sub P to W serial output
3	EXCK	I	SBSO read-out clock input
4	SQSO	O	Sub Q 80-bit serial output
5	SQCK	I	SQSO read-out clock input
6	MUTE	I	High : mute; Low : release (DAC)
7	SENS	O	SENS output to CPU
8	XRST	I	System reset; Reset when low
9	DATA	I	Serial data input from CPU
10	XLAT	I	Latch input from CPU; Serial data is latched at the falling edge
11	CLOK	I	Serial data transfer clock input from CPU
12	V_{SS}		GND
13	SEIN	I	Sense input from SSP
14	CNIN	I	Track jump count signal input
15	DATO	O	Serial data output to SSP
16	XLTO	O	Serial data latch output to SSP; Latched at the falling edge
17	CLKO	O	Serial data transfer clock output to SSP
18-20	SPOA,SPOB,SPOC	I	u-com extended interface (input A-C)
21	XTSL	I	Crystal selection input; Set low when the crystal is 16.9344MHz, high when 33.8688MHz
22	XLON	O	u-com extended interface (output)
23	FOK	I	Focus OK input; Used for SENS output and the servo auto sequencer
24	MON	O	Spindle motor ON/OFF control output
25, 26	MDP, MDS	O	Spindle motor servo control
27	LOCK	O	GFS is sampled at 460Hz; when GFS is high, this pin outputs a high signal. If GFS is low eight consecutive samples, this pin outputs low.
28	TEST	I	Test pin (normally GND)
29	FILO	O	Master PLL (slave=digital PLL) filter output
30	FILI	I	Master PLL filter input
31	PCO	O	Master PLL charge pump output
32	V_{DD}		Digital power supply for DSP
33	$AV_{SS}1$		GND (analog) for DSP
34	CLTV	I	Master VCO control voltage input
35	$AV_{DD}1$		Analog power supply for DSP
36	RF	I	EFM signal input
37	BIAS	I	Constant current input of asymmetry circuit
38	ASYI	I	Asymmetry comparator voltage input
39	ASYO	O	EFM full-swing output (low=V_{SS}, high=V_{DD})
40	ASYE	I	Low : asymmetry circuit off; High : asymmetry circuit on
41	WDCK	O	D/A interface for 48-bit; Word clock f=2Fs
42	LRCK	O	D/A interface for 48-bit; LR clock f=Fs

CIRCUIT DESCRIPTION

No.	Name	I/O	Description
43	LRCKI	I	LR clock input to DAC
44	PCMD	O	D/A interface; Serial data (two's complement, MSB first)
45	PCMDI	I	Audio data input to DAC (48-bit)
46	BCK	O	D/A interface; Bit clock
47	BCKI	I	Bit clock input to DAC (48-bit)
48	GTOP	O	GTOP output
49	XUGF	O	XUGF output
50	XPCK	O	XPLCK output
51	GFS	O	GFS output
52	RFCK	O	RFCK output
53	V_{SS}		GND
54	C2PO	O	C2PO output
55	XROF	O	XRAOF output
56-58	MNT3,MNT1,MNT0	O	MNT3, MNT1, MNT0 output
59	FSTT	O	2/3 frequency divider output for pins 73 and 74
60	C4M	O	4.2336 MHz output
61	DOUT	O	Digital-out output
62	DMPH	O	Outputs high signal when the playback disc has emphasis, low signal when no emphasis
63	EMPHI	I	DAC de-emphasis ON/OFF; High=ON, Low=OFF
64	WFCK	O	WFCK (Write Frame Clock) output
65	ZEROL	O	No-sound data detection; High=detected (L ch)
66	ZEROR	O	No-sound data detection; High=detected (R ch)
67	DTS1	I	Test pin 1 for DAC (normally Low)
68	V_{DD}		Digital power supply for DAC
69	NLPWM	O	L ch PWM output
70	LPWM	O	L ch PWM output
71	$AV_{DC}2$		Power supply for PWM driver
72	$AV_{DC}3$		Power supply for crystal
73	XTAI	I	33.8688MHz crystal oscillation circuit input
74	XTAO	O	33.8688MHz crystal oscillation circuit output
75	$AV_{SS}3$		GND for crystal
76	$AV_{SS}2$		GND for PWM driver
77	NRPWM	O	R ch PWM output
78	RPWM	O	R ch PWM output
79, 80	DTS2,DTS3	I	Test pin 2, 3 for DAC (normally Low)

Notes:

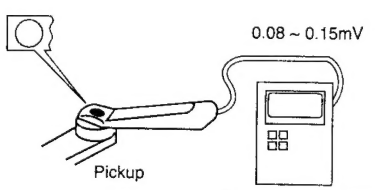
- PCMD is two's complement output of MSB first.
- GTOP is used to monitor the frame sync protection status. (H:Sync protection window free)
- XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
- XPLCK is the inverse of EFM PLL clock. The PLL is designed so that the falling edge and the EFM signal transition point coincide.
- GFS goes high when the frame sync and the insertion protection timing match.
- RFCK is derived from the crystal accuracy. This signal has cycle of 136μ.
- C2PO represents the data error status.
- XRAOF is generated when the 16K RAM exceeds the ±4F jitter margin.

ADJUSTMENT

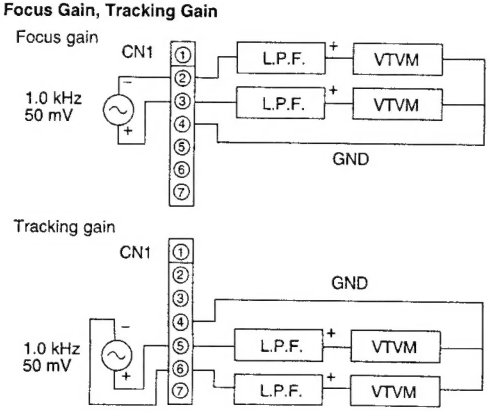
No.	ITEM	INPUT SETTING	OUTPUT SETTING	PLAYER SETTING	ALIGNMENT POINT	ALIGN FOR	FIG.
Remove the clamper ass'y before step 1. And remount it after step 1.							
1	LASER POWER	-	Set the sensor section of the optical power meter on the pickup lens.	With pressing the TIME key, turn the power on to enter the test mode. Press the PLAY key to check that the display is "03".	-	On the power from 0.08 to 0.15 mW, when the diffraction grating is correctly aligned with the RF level of 1.0Vp-p or more.	(a)
Clamp the disc beforehand.							
2	FOCUS ERROR	Test disc Type 4	Connect an oscilloscope as follows. CH1:RF (CN1-1) CH2:FE (CN1-2)	With pressing the TIME key, turn the power on. Press the PLAY key.Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.)	TE BALANCE VR3	Optimum eye pattern	(b) or (d)
3	TRACKING ERROR	Test disc Type 4	Connect an oscilloscope as follows. CH1:RF (CN1-1) CH2:TE (CN1-6)	Press the PLAY key. Confirm the display is "03". (Each press of the PLAY key changes the display 03↔05.)	TE BALANCE VR4	Symmetry between upper and lower	(c)
4	FOCUS GAIN	Test disc Type 4 Apply signal of 1.0 kHz, 50mVrms to CN1 pin 2-3.	Connect a LPF to CN1 pin 2-3 to which connect an oscilloscope or AC voltmeters.	Press the PLAY key.Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.)	FOCUS GAIN VR1	Two VTVMs should read the same value.	(e)
5	TRACKING GAIN	Test disc Type 4 Apply signal of 1.0 kHz, 50mVrms to CN1 pin 5-6.	Connect a LPF to CN1 pin 5-6 to which connect an oscilloscope or AC voltmeters.	Press the PLAY key.Confirm the display is "05". (Each press of the PLAY key changes the display 03↔05.)	TRACKING GAIN VR2	Two VTVMs should read the same value.	(e)

Note:
Type 4disc :SONY YEDS-18 Test Disc or equivalent.
LPF : Around 47kΩ + 390 pF or so.
Step 1 ~ 5 are in Test Mode.

(a) Laser power



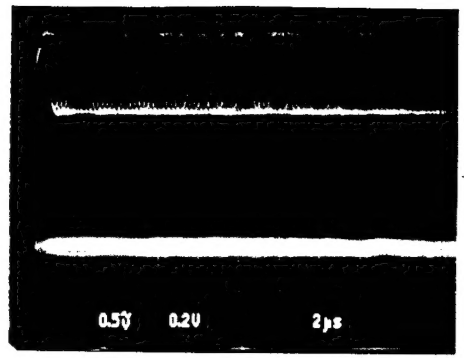
(e) Focus Gain, Tracking Gain



DP-R49

ADJUSTMENT

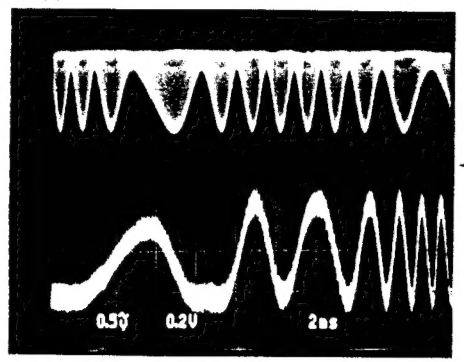
FIG.(b)



(2μsec/div) projection

- RF signal and E.Spot signal in. test mode (PLAY).
- If the diffraction grating has.been adjusted properly, the influence of triggering is observed on the E.Spot waveform of appox. 18us after RF signal, in the form of a projection.

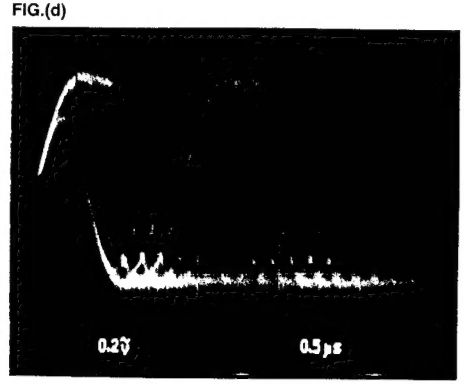
FIG.(c)



(2μsec/div)

- RF signal and T.Error signal in test mode (Focusing ON). (Disc Type 4).
- Adjust T.Error so that the waveform is symmetrical above and below VREF(VR4).

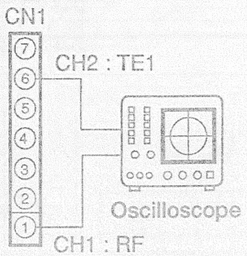
FIG.(d)



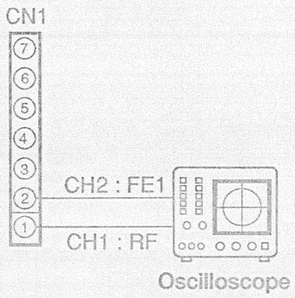
- RF signal in test mode (PLAY).
- Perform the tangential and focusing offset adjustments so that each of the center cross points are focused into one point on the display. The crossing points above and below the center shall also be displayed clearly.

PC BOARD (COMPONENT SIDE VIEW) CD Player unit (X32-2992-70)

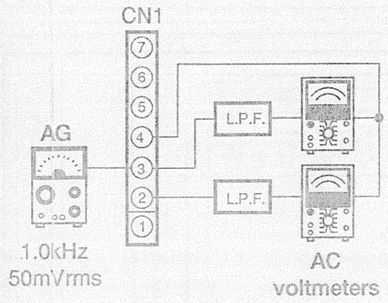
Tracking error balance :
Symmetry between
upper and lower patterns for VC



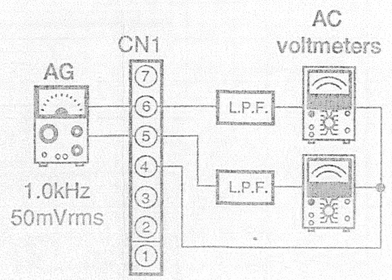
Focus error balance :
Optimum eye pattern

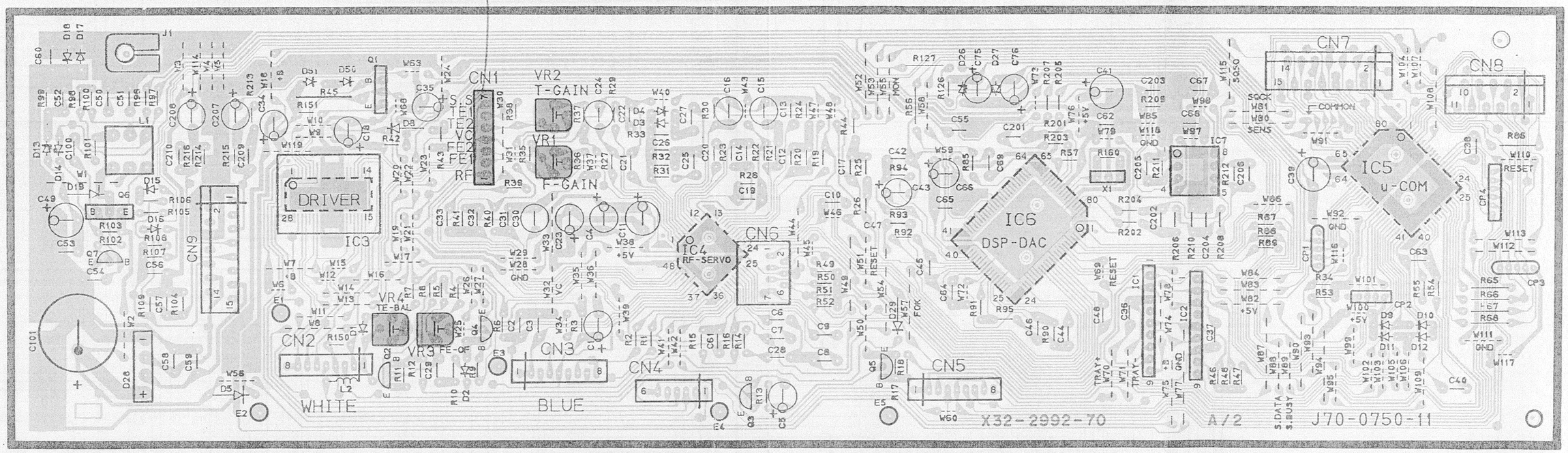


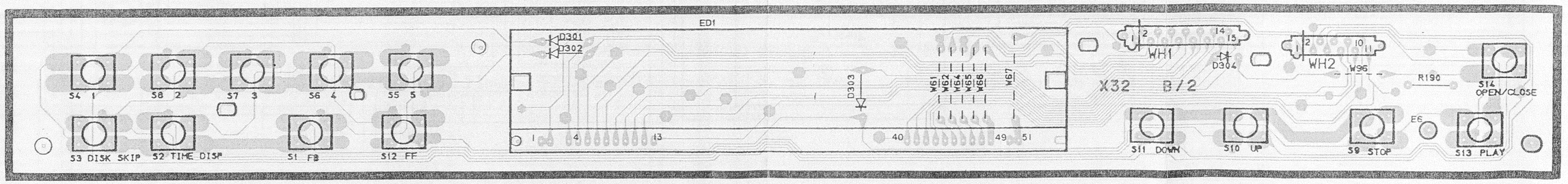
Focus gain :
Two VTVMs should read the same value.



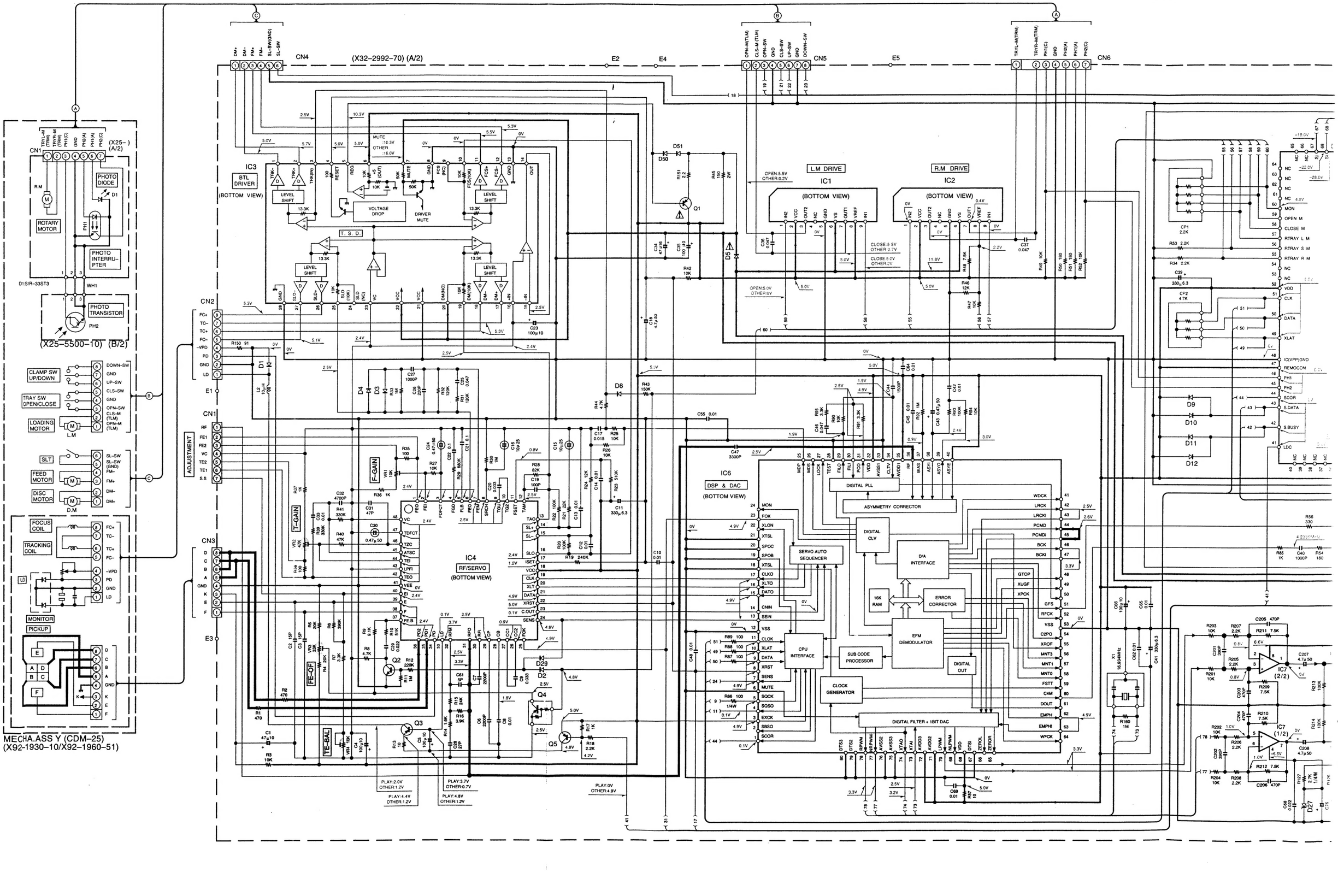
Tracking gain :
Two VTVMs should read the same value.



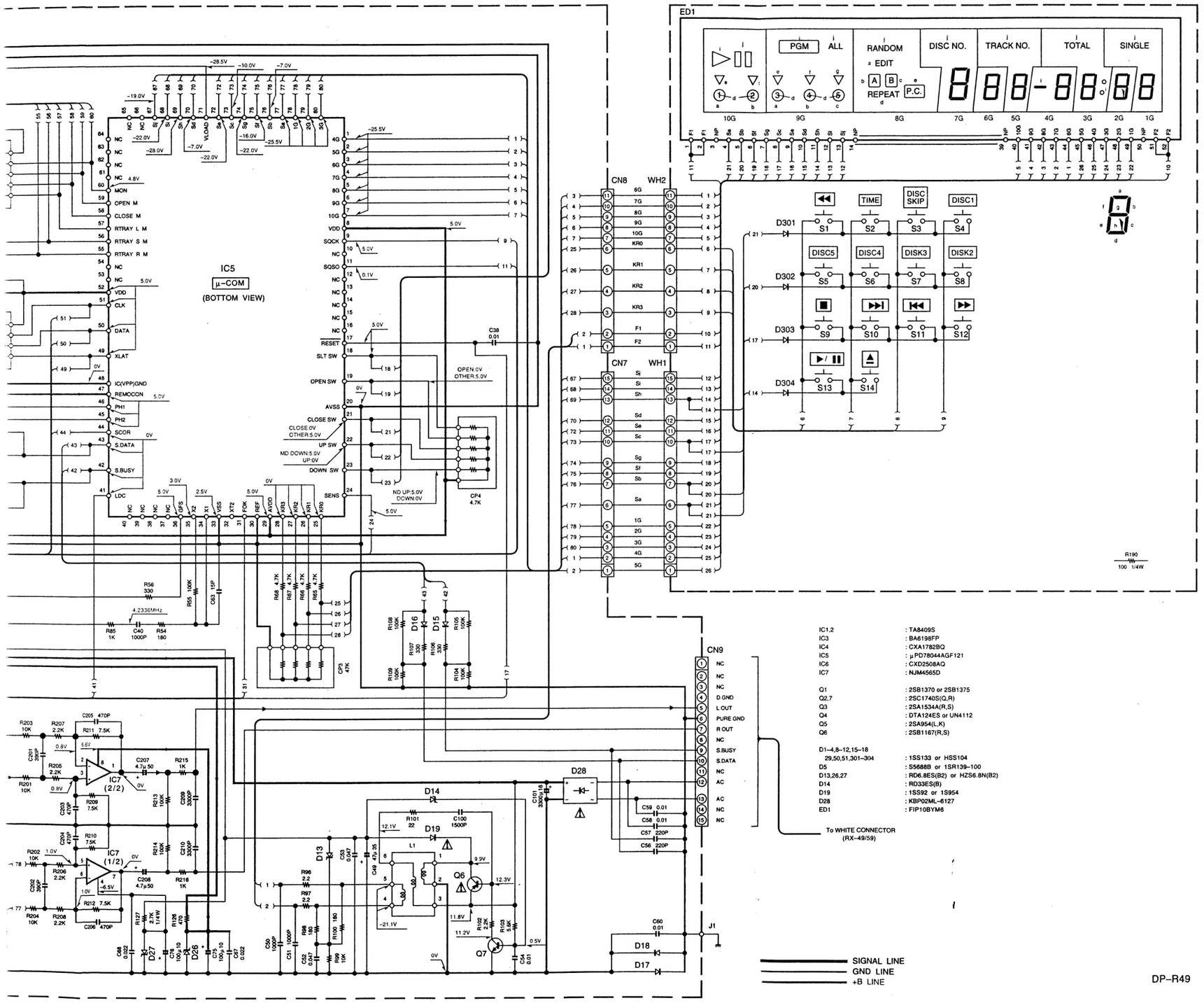




Refer to the schematic diagram for the value of resistors and capacitors.


CN4
(X32-2992-70) (A/2)
CN5
CN6
CN1
(X25-) (A/2)
IC3
BTL DRIVER
(BOTTOM VIEW)
IC1
L.M DRIVE
(BOTTOM VIEW)
IC2
R.M DRIVE
(BOTTOM VIEW)
CN2
CN3
IC4
RF/SERVO
(BOTTOM VIEW)
IC6
DSP & DAC
(BOTTOM VIEW)
ROTARY MOTOR
PHOTO DIODE
PHOTO INTERRUPTER
PHOTO TRANSISTOR
D1:SIR-33ST3
WH1
PH1
PH2
(X25-5500-10) (B/2)
CLAMP SW UP/DOWN
TRAY SW OPEN/CLOSE
LOADING MOTOR
L.M
SLT
FEED MOTOR
DISC MOTOR
D.M
FOCUS COIL
TRACKING COIL
MONITOR
PICKUP
MECHA.ASS Y (CDM-25)
(X92-1930-10/X92-1960-51)
VOLTAGE DROP
DRIVER MUTE
T. S. D.
LEVEL SHIFT
F-GAIN
T-GAIN
FE-OFF
TE-BAL
DIGITAL PLL
ASYMMETRY CORRECTOR
DIGITAL CLV
SERVO AUTO SEQUENCER
D/A INTERFACE
16K RAM
ERROR CORRECTOR
EFM DEMODULATOR
CPU INTERFACE
SUB CODE PROCESSOR
DIGITAL OUT
CLOCK GENERATOR
DIGITAL FILTER + 1BIT DAC
IC7 (1/2)
IC7 (2/2)
PLAY:2.0V OTHER:1.2V
PLAY:4.4V OTHER:1.2V
PLAY:3.7V OTHER:0.7V
PLAY:4.8V OTHER:1.2V
PLAY:0V OTHER:4.9V

(X32-)(B/2)



IC1,2 : TA8409S
IC3 : BA6198FP
IC4 : CXA1782BQ
IC5 : μPD78044AGF121
IC6 : CXD2508AQ
IC7 : NJM4565D

Q1 : 2SB1370 or 2SB1375
Q2,7 : 2SC1740S(Q,R)
Q3 : 2SA1534A(R,S)
Q4 : DTA124ES or UN4112
Q5 : 2SA954(L,K)
Q6 : 2SB1167(R,S)

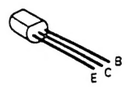
D1-4,8-12,15-18, 29,50,51,301-304 : 1SS133 or HSS104
D5 : S5688B or 1SR139-100
D13,26,27 : RD6.8ES(B2) or HZS6.8N(B2)
D14 : RD33ES(B)
D19 : 1SS92 or 1S954
D28 : KBP02ML-6127
ED1 : FIP10BYM6

DP-R49

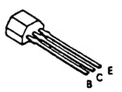
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). ⚠ indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is retuned to the customer.

- DC voltages are as measured with a high impedance voltmeter. Values may vary slightly due to variations between individual instruments or/and units.

2SA1534A
2SA954



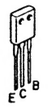
DTA124ES
UN4112
2SC1740S



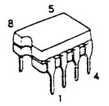
2SB1370

2SB1375

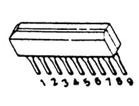
2SB1167



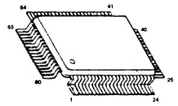
NJM4565D



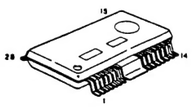
TA8409S



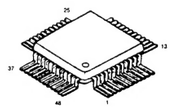
CXD2508AQ
UPD78044AGF121



BA6198FP



CXA1782BQ



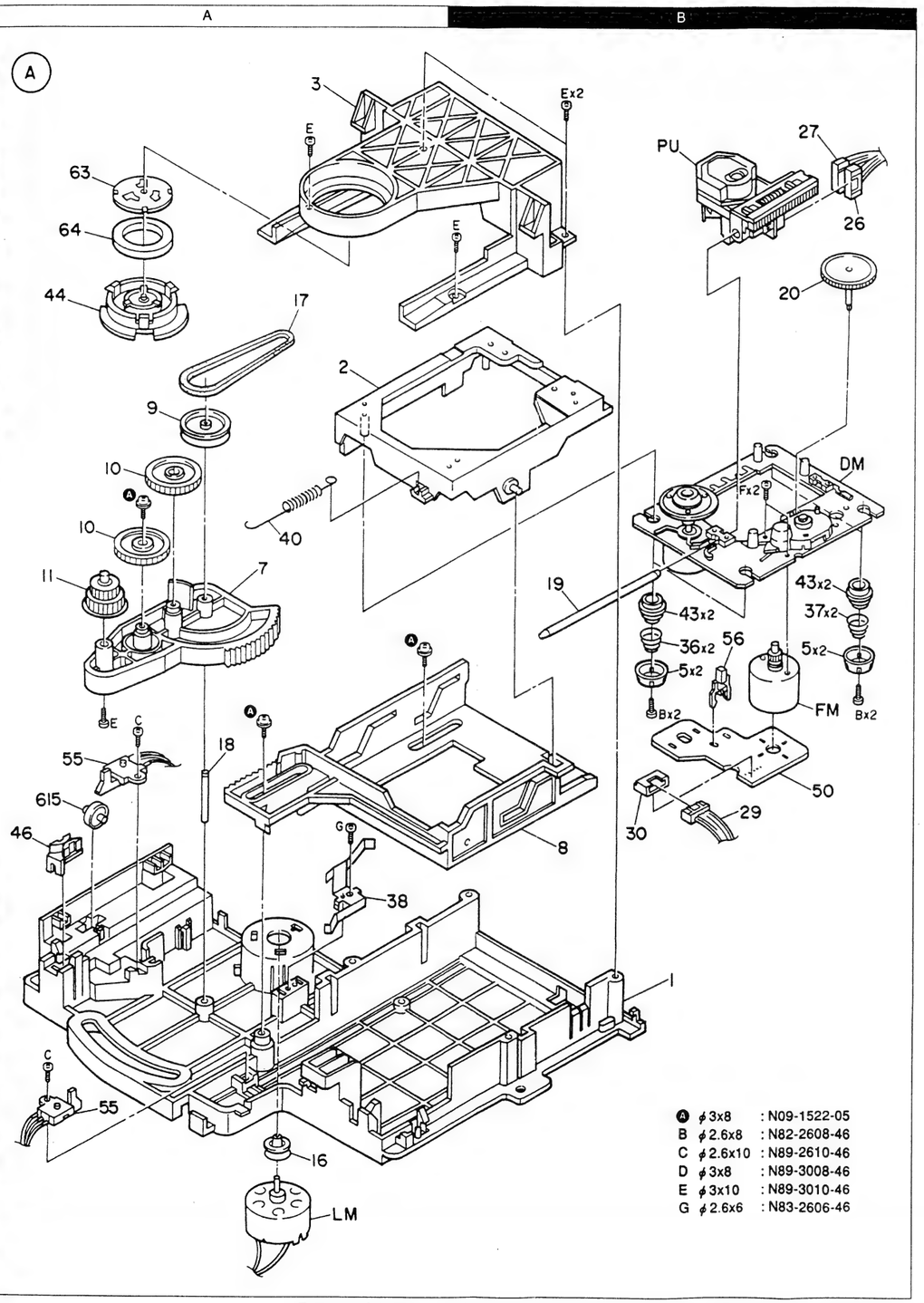
Y22-4222-70

DP-R4

KENWOOD

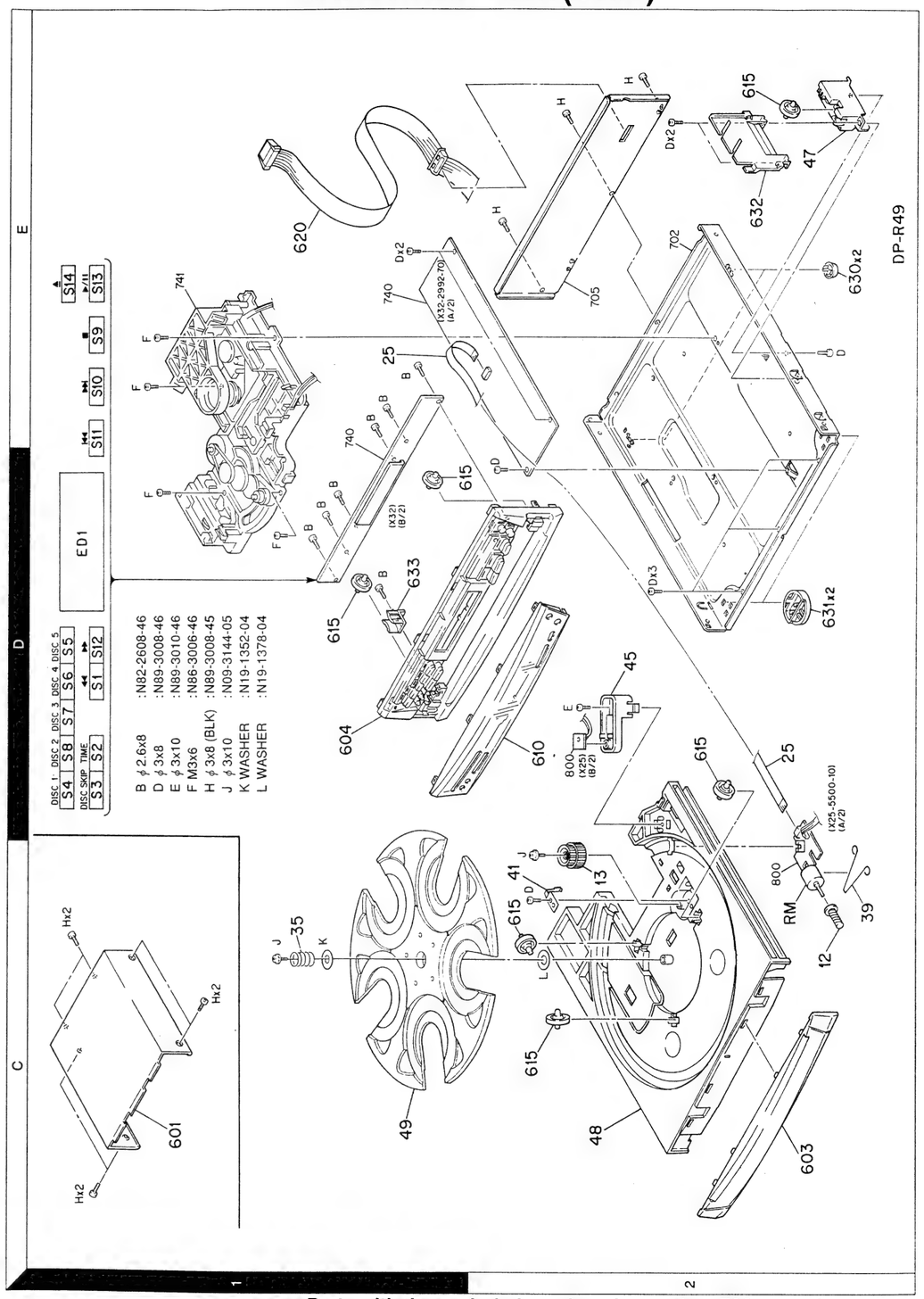
DP-R49

EXPLODED VIEW(MECHANISM)



Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW(UNIT)



Parts with the exploded numbers larger than 700 are not supplied.

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Teile ohne **Parts No.** werden nicht geliefert.

NO.1

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
DP-R49						
601	1C	*	A01-3252-01	METALLIC CABINET		
603	2C	*	A29-0802-02	PANEL		
604	1D	*	A60-0755-01	PANEL		
610	2D	*	B10-2123-02	FRONT GLASS		
615	1D,2D		D14-0357-04	ROLLER		
620	1E		E30-2723-05	CORD WITH CONNECTOR(15P) WHITE		
		*	H50-1541-04	ITEM CARTON CASE	EGYXT	
		*	H50-1542-04	ITEM CARTON CASE	MI	
-		*	H10-7064-12	POLYSTYRENE FOAMED FIXTURE (L)		
-		*	H10-7065-12	POLYSTYRENE FOAMED FIXTURE (R)		
-			H20-0568-04	PROTECTION COVER	MI	
-			H21-0303-04	PROTECTION SHEET		
-			H25-1516-04	PROTECTION BAG	EGYXT	
630	2E		J02-0370-05	FOOT (REAR)		
631	2D		J02-1122-05	FOOT (FRONT)		
632	2E	*	J19-5606-03	HOLDER		
633	1D		J90-0811-04	GUIDE		
MECHANISM PCB (X25-5500-10)						
CN1	2D		E40-4187-05	FLAT CABLE CONNECTOR (7P)		
PH1		*	T95-0132-05	OPTO ISOLATOR		
D1			SIR-33ST3	INFRARED LED		
PH2		*	RPT-38PT3F	PHOTO TRANSISTOR		
CD PLAYER UNIT(X32-2992-70)						
C1			CE04LW1A470M	ELECTRO 47UF 10WV		
C2,3			CC45FSL1H150J	CERAMIC 15PF J		
C4,5			CE04LW1A101M	ELECTRO 100UF 10WV		
C6,7			CK45FB1H222K	CERAMIC 2200PF K		
C8			CQ93FMG1H103J	MYLAR 0.010UF J		
C9			CQ93FMG1H333J	MYLAR 0.033UF J		
C10			CK45FF1H103Z	CERAMIC 0.010UF Z		
C11			CE04LW0J331M	ELECTRO 330UF 6.3WV		
C12			CK45FF1H103Z	CERAMIC 0.010UF Z		
C13,14			CQ93FMG1H103J	MYLAR 0.010UF J		
C15,16			CE04HW1E100M	NP-ELEC 10UF 25WV		
C17			CQ93FMG1H153J	MYLAR 0.015UF J		
C18			CE04LW1H4R7M	ELECTRO 4.7UF 50WV		
C19			CC45FSL1H101J	CERAMIC 100PF J		
C20			CQ93FMG1H333J	MYLAR 0.033UF J		
C21,22			CQ93FMG1H104J	MYLAR 0.10UF J		
C23			CE04LW1A101M	ELECTRO 100UF 10WV		
C24			CE04HW1HR47M	NP-ELEC 0.47UF 50WV		
C25			CQ93FMG1H473J	MYLAR 0.047UF J		
C26			CC45FSL1H221J	CERAMIC 220PF J		
C27			CK45FB1H102K	CERAMIC 1000PF K		
C28			CC45FSL1H270J	CERAMIC 27PF J		

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NO.2

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
C29			CQ93FMG1H223J	MYLAR 0.022UF J		
C30			CE04HW1HR47M	NP-ELEC 0.47UF 50WV		
C31			CC45FSL1H470J	CERAMIC 47PF J		
C32			CQ93FMG1H472J	MYLAR 4700PF J		
C33			CQ93FMG1H103J	MYLAR 0.010UF J		
C34			CE04LW1C470M	ELECTRO 47UF 16WV		
C35			CE04LW1A101M	ELECTRO 100UF 10WV		
C36,37			CQ93FMG1H473J	MYLAR 0.047UF J		
C38			CK45FF1H103Z	CERAMIC 0.010UF Z		
C39			CE04LW0J331M	ELECTRO 330UF 6.3WV		
C40			CK45FB1H102K	CERAMIC 1000PF K		
C41			CE04LW0J331M	ELECTRO 330UF 6.3WV		
C42			CQ93FMG1H103J	MYLAR 0.010UF J		
C43			CE04LW1HR47M	ELECTRO 0.47UF 50WV		
C44			CK45FB1H152K	CERAMIC 1500PF K		
C45			CK45FF1H103Z	CERAMIC 0.010UF Z		
C46			CQ93FMG1H473J	MYLAR 0.047UF J		
C47			CQ93FMG1H332J	MYLAR 3300PF J		
C48			CK45FF1H103Z	CERAMIC 0.010UF Z		
C49			CE04LW1V470M	ELECTRO 47UF 35WV		
C50,51			CK45FB1H102K	CERAMIC 1000PF K		
C52,53			CK45FF1H473Z	CERAMIC 0.047UF Z		
C54,55			CK45FF1H103Z	CERAMIC 0.010UF Z		
C56,57			CC45FSL1H221J	CERAMIC 220PF J		
C58-60			CK45FF1H103Z	CERAMIC 0.010UF Z		
C61			CC45FCH1H050C	CERAMIC 5.0PF C		
C62			CK45FF1H103Z	CERAMIC 0.010UF Z		
C63			CC45FSL1H150J	CERAMIC 15PF J		
C64,65			CK45FF1H103Z	CERAMIC 0.010UF Z		
C66			CE04LW1A101M	ELECTRO 100UF 10WV		
C67,68			CQ93FMG1H223J	MYLAR 0.022UF J		
C69			CK45FF1H103Z	CERAMIC 0.010UF Z		
C75,76			CE04LW1A101M	ELECTRO 100UF 10WV		
C100			CK45FB1H152K	CERAMIC 1500PF K		
C101			CE04LW1C332M	ELECTRO 3300UF 16WV		
C201,202			CK45FB1H391K	CERAMIC 390PF K		
C203-206			CK45FB1H471K	CERAMIC 470PF K		
C207,208			CE04LW1H4R7M	ELECTRO 4.7UF 50WV		
C209,210			CK45FB1H332K	CERAMIC 3300PF K		
CN1	1E		E40-4876-05	PIN ASSY (7P)		
CN2,3	1E		E40-3252-05	PIN ASSY (8P)		
CN4	1E		E40-3250-05	PIN ASSY (6P)		
CN5	1E		E40-3252-05	PIN ASSY (8P)		
CN6	1E		E40-4187-05	FLAT CABLE CONNECTOR (7P)		
CN7	1E		E40-4609-05	PIN ASSY (15P)		
CN8	1E		E40-4808-05	PIN ASSY (11P)		
CN9	1E		E40-4609-05	PIN ASSY (15P)		
E1-5			J11-0098-05	WIRE CLAMPER		
L1			L19-0076-05	TRANSFORMER FOR CONVERTER		
L2			L40-1001-17	SMALL FIXED INDUCTOR(10UH,K)		
X1			L78-0299-05	RESONATOR (16.93MHz)		
CP1			R90-0852-05	MULTI-COMP 2.2KX4		
CP2			R90-0832-05	MULTI-COMP 4.7KX3 J 1/6W		

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NO.3

Ref. No.	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
CP3			R90-0487-05	MULTI-COMP 47KX4 J 1/6W		
CP4			R90-0892-05	MULTI-COMP 4.7KX5		
R45			RS14KB3D151J	FL-PROOF RS 150 J 2W		
VR1			R12-3685-05	TRIMMING POT.(10K F-GAIN)		
VR2			R12-3688-05	TRIMMING POT.(47K T-GAIN)		
VR3			R12-3687-05	TRIMMING POT.(33K FE-OF)		
VR4			R12-3685-05	TRIMMING POT.(10K TE-BAL)		
S1-14			S40-1064-05	PUSH SWITCH		
D1-4			HSS104	DIODE		
D1-4			1SS133	DIODE		
⚠ D5			S5688B	DIODE		
⚠ D5			1SR139-100	DIODE		
D8-12			HSS104	DIODE		
D8-12			1SS133	DIODE		
D13			HZS6.8N(B2)	ZENER DIODE		
D13			RD6.8ES(B2)	ZENER DIODE		
D14			RD33ES(B)	ZENER DIODE		
D15 -18			HSS104	DIODE		
D15 -18			1SS133	DIODE		
⚠ D19			1SS92	DIODE		
⚠ D19			1S954	DIODE		
D26,27			HZS6.8N(B2)	ZENER DIODE		
D26,27			RD6.8ES(B2)	ZENER DIODE		
⚠ D28			KBP02ML-6127	DIODE		
D29			HSS104	DIODE		
D29			1SS133	DIODE		
D50,51			HSS104	DIODE		
D50,51			1SS133	DIODE		
D301-304			HSS104	DIODE		
D301-304			1SS133	DIODE		
ED1		*	FIP10BYM6	INDICATOR TUBE		
IC1,2			TA8409S	IC(MOTOR CONTROL)		
IC3			BA6198FP	ANALOGUE IC		
IC4			CXA1782BQ	MOS-IC		
IC5		*	UPD78044AGF121	MI-COM IC		
IC6			CXD2508AQ	MOS-IC		
IC7			NJM4565D	IC(OP AMP X2)		
⚠ Q1			2SB1370	TRANSISTOR		
⚠ Q1			2SB1375	TRANSISTOR		
Q2			2SC1740S(Q,R)	TRANSISTOR		
Q3			2SA1534A(R,S)	TRANSISTOR		
Q4			DTA124ES	DIGITAL TRANSISTOR		
Q4			UN4112	TRANSISTOR		
Q5			2SA954(L,K)	TRANSISTOR		
⚠ Q6			2SB1167(R,S)	TRANSISTOR		
Q7			2SC1740S(Q,R)	TRANSISTOR		
MECHANISM (X92-1930-10/X92-1960-51)						
1	3B		A10-3121-32	CHASSIS ASSY		
2	1A		A11-1048-02	SUB CHASSIS		
3	1A		A11-1017-12	SUB CHASSIS		
DM	2B		A11-1038-08	TT CHASSIS ASSY		

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NO.4

Ref. No.	Add-ress	New Parts	Parts No.	Description	Desti-nation	Re-marks
5	2B		B09-0250-04	CAP		
7	2A		D10-3439-13	ARM		
8	2B		D10-3438-12	SLIDER		
9	1A		D13-1577-04	GEAR		
10	2A		D13-1578-04	GEAR		
11	2A		D13-1579-04	GEAR		
12	2C		D13-1682-04	WORM		
13	2C		D13-1581-04	GEAR		
16	3A		D15-0359-04	PULLEY		
17	1A		D16-0355-03	BELT		
18	2A		D21-1763-04	SHAFT		
19	2B		D10-3492-08	FEED SHAFT		
20	1B		D13-1643-08	GEAR (A)		
25	1E,2C		E35-0747-25	FLAT CABLE (7P)		
26	1B		E35-0748-15	WIRING HARNESS (8P)		
27	1B		E35-0749-15	WIRING HARNESS (8P)		
29	2B		E35-0751-15	WIRING HARNESS (6P)		
30	2B		E40-3264-05	CONNECTOR (6P)		
35	1C		G01-3630-14	COMPRESSION SPRING		
36	2B		G01-3753-04	COMPRESSION SPRING		
37	2B		G01-3754-04	COMPRESSION SPRING		
38	3A		G02-1049-04	FLAT SPRING		
39	2C		G09-0634-04	WIRE SPRING		
40	2A		G01-3697-24	EXTENSION SPRING		
41	2C		G02-1065-04	FLAT SPRING		
43	2B		J02-1121-04	INSULATOR		
44	1A		J11-0198-03	CLAMPER		
45	2D		J19-3634-04	HOLDER		
46	2A		J90-0811-04	GUIDE		
47	2E	*	J90-0834-02	GUIDE		
48	2C	*	J99-0575-01	TRAY		
49	1C		J99-0547-01	TRAY		
50	2B		J70-0619-08	MOTOR PCB		
A	2A		N09-1522-05	SET SCREW (3X8)		
J	1C,2C		N09-3144-05	SET SCREW (3X10)		
K	1C		N19-1352-04	FLAT WASHER		
L	2C		N19-1378-04	FLAT WASHER		
55	2A,3A		S33-2061-05	LEVER SWITCH		
56	2B		S74-0038-08	LEAF SWITCH		
63	1A		T50-1055-04	YOKE		
64	1A		T99-0544-15	MAGNET		
FM	2B		T42-0676-08	MOTOR GEAR (FEED)		
LM	3A		T42-0524-05	DC MOTOR		
PU	1B		T25-0011-05	PICKUP (KSS-210A)		
RM	2C		T42-0670-05	DC MOTOR		

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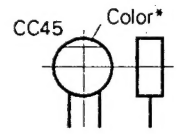
PARTS LIST

CAPACITORS

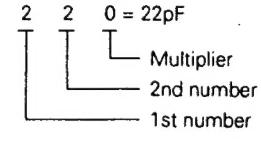
CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc.
2 = Shape ... round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001µF
103 = 0.01µF



• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = -470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10µF -10 ~ +50 Less than 4.7µF -10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

1st word \ 2nd word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

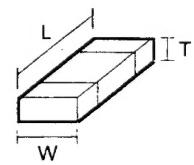
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

RESISTORS

• Chip resistor (Carbon)

(EX) R K 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

Dimension



• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Rating wattage
6 = Value
7 = Tolerance

Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6±0.2	0.8±0.2	0.5±0.1

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

DP-R49

SPECIFICATIONS

Laser .....Semiconductor laser
Playing rotation .....200 rpm ~ 500 rpm (CLV)
Wow & Flutter .....Unmeasurable Limit

[General]
Dimensions .....W: 360 mm (14-3 /16")
H:109 mm (4-5/16")
D:415 mm (16-5/16")
Weight (net) .....4.0 kg (8.8lb)

KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Note:
Component and circuity are subject to modification to insure best operation under differing local conditions. This manual is based on the General market(M) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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